Move Over, Bossie! Sorghum's Not Just for Cows Anymore

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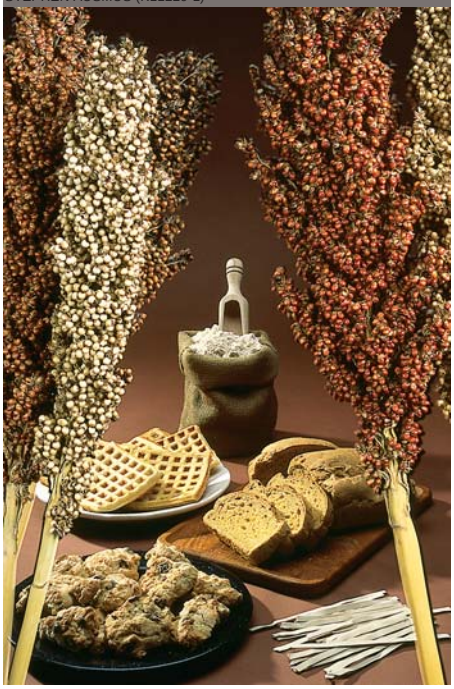

Sorghum stalks and some products produced from the grain. Clockwise from bottom left: cookies, waffles, flour, bread, and noodles.

Americans have been missing out on a tasty and hearty grain. While sorghum has been part of the human diet in Africa and India for centuries, in the United States, the sorghum crop has been used mainly to feed livestock.

But this grain, also known as milo, is getting an image boost. Forget the syrup that many of us associate with sorghum; the grain could soon be making its way into staple foods like breads, waffles, and noodles. With its gluten-free status and exciting health attributes, food-grade sorghum—recognized by its tan plant color and white berries—is also being investigated for use in cookies, granola cereals, snack bars, and even a light beer.

ARS chemist Scott R. Bean is looking for new uses for the versatile grain. Bean hopes to understand how sorghum's starch, lipids, and especially proteins affect end-use qualities like taste and texture.

What makes sorghum attractive to many consumers, though, is what it's missing.

"Because it lacks gluten—certain proteins present in wheat and two closely related cereals, rye and barley—sorghum is considered safe for the 1 to 2 million people in the United States diagnosed with celiac disease, a condition marked by an intolerance to gluten," says Bean.

But gluten proteins are what give dough made from wheat flour its visco-elasticity, a necessary quality in making breads and other baked products.

"Sorghum proteins are different from most other grain proteins. They're very tough and strong," says Bean. "This makes them more difficult to handle and analyze."

In addition to determining the function of sorghum proteins, Bean and collaborators from Ireland and Germany are baking their way towards good-tasting, finely textured sorghum bread. In a recent study, the researchers used nine food-grade varieties to produce loaves of wheat-free, 70-percent-sorghum bread.

By analyzing bread-crumb structure and texture, the scientists rated the loaves, noting significant differences among them. The winning hybrids yielded breads with a fine crumb structure and a high overall number of cells.

"Seeing differences among the hybrids is good news," says Bean. "It means there's a real possibility that sorghum can be improved for end-uses—like breads."

Currently Bean is working with his colleagues at ARS's Hard Winter Wheat Quality Laboratory in Manhattan, Kansas, to produce a visco-elastic dough from sorghum flour—the next step in making a high-quality, 100-percent-sorghum bread.

They are also developing recipes for other baked goods made with the grain.

"We hope to create a quick and tasty breakfast food for those with gluten intolerance, especially children," he says.

Besides being gluten-free, sorghum is also attracting attention for its ability to quench free radicals. Some varieties contain high levels of cancer-fighting phenols and tannins and even exceed blueberries—according to some assays—in antioxidant potential. High in insoluble fiber too, specialty sorghum brans could become unrivaled sources of antioxidants in foods.—By **Erin Peabody,** ARS.

This research is part of Quality and Utilization of Agricultural Products, an ARS National Program (#306) described on the World Wide Web at www.nps.ars.usda.gov.

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